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Anderson et al.

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[45] Date of Patent: *Aug. 1, 2000

[54] **METHOD AND SYSTEM FOR REVIEWING AND NAVIGATING AMONG IMAGES ON AN IMAGE CAPTURE UNIT**

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[73] Assignee: **FlashPoint Technology, Inc.**, San Jose, Calif.

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[22] Filed: **Sep. 4, 1996**

[51] **Int. Cl.**[7] **H04N 5/76**; H04N 7/00; H04N 11/00

[52] **U.S. Cl.** **348/233**; 348/552; 345/353

[58] **Field of Search** 348/333, 334, 348/552, 233, 231; 345/338, 351, 353

[56] **References Cited**

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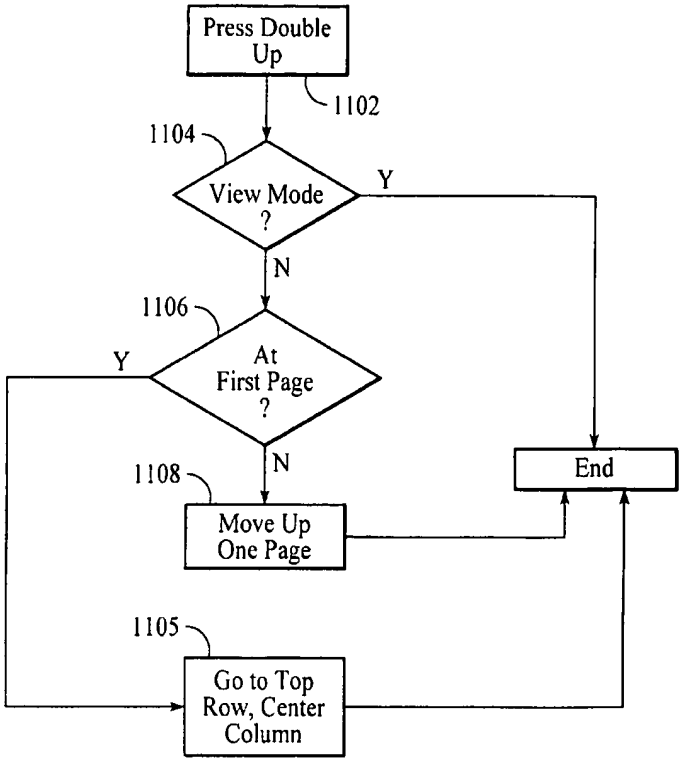
Primary Examiner—Wendy Garber
Assistant Examiner—Alicia Harrington
Attorney, Agent, or Firm—Sawyer Law Group LLP

[57] **ABSTRACT**

A method and system for reviewing and navigating through images displayed on an image capture unit is provided. A method and system includes displaying images in a predetermined number of group types. Each of the group types indicates a number of images to be displayed at a time. The number of images displayed at a time being a page of images. The method includes selecting one group type from the predetermined number of group types and navigating through a plurality of images within the group type through the use of a highlighting area surrounding an image to be selected. Finally, the method and system includes selecting a particular image within the group type based upon the highlighted area. In one aspect, the method and system includes a four-way button to facilitate ease of movement between an image or cell and between pages of images. It also includes a mode button which allows for movement between group types and a view button to facilitate selection of a particular image. In addition, a method and system in accordance with the present invention allows for more natural movement for selection through the use of the four-way button in conjunction with the other buttons. Accordingly, navigation through images can be accomplished in a more expeditious fashion.

14 Claims, 21 Drawing Sheets



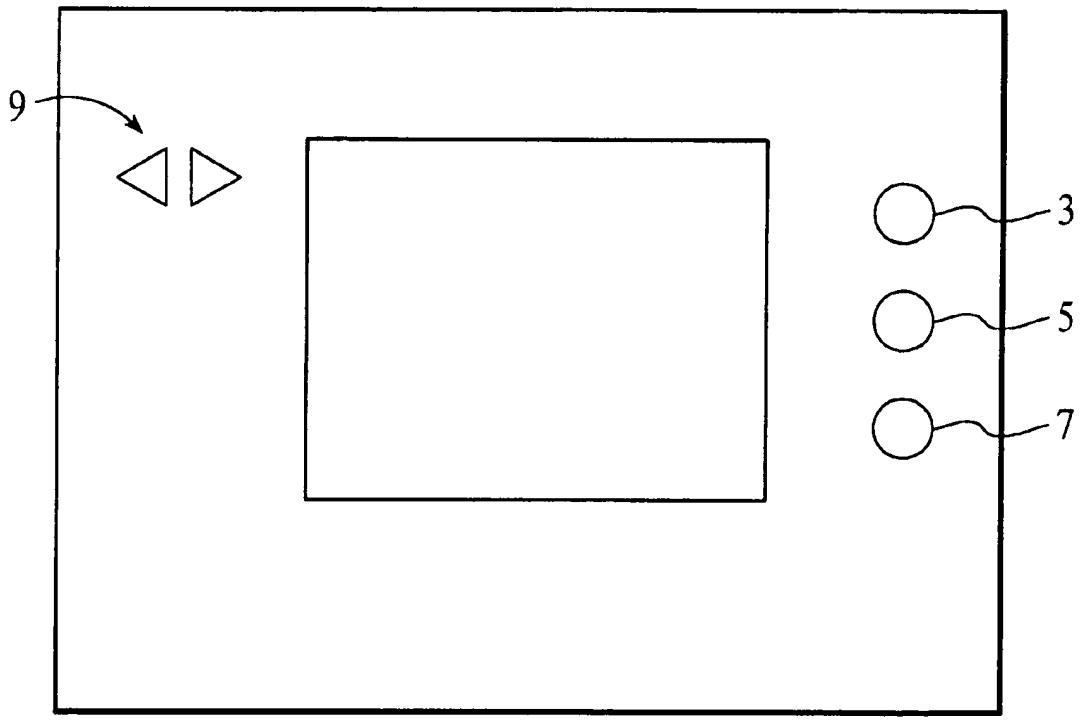


FIG. 1
(PRIOR ART)

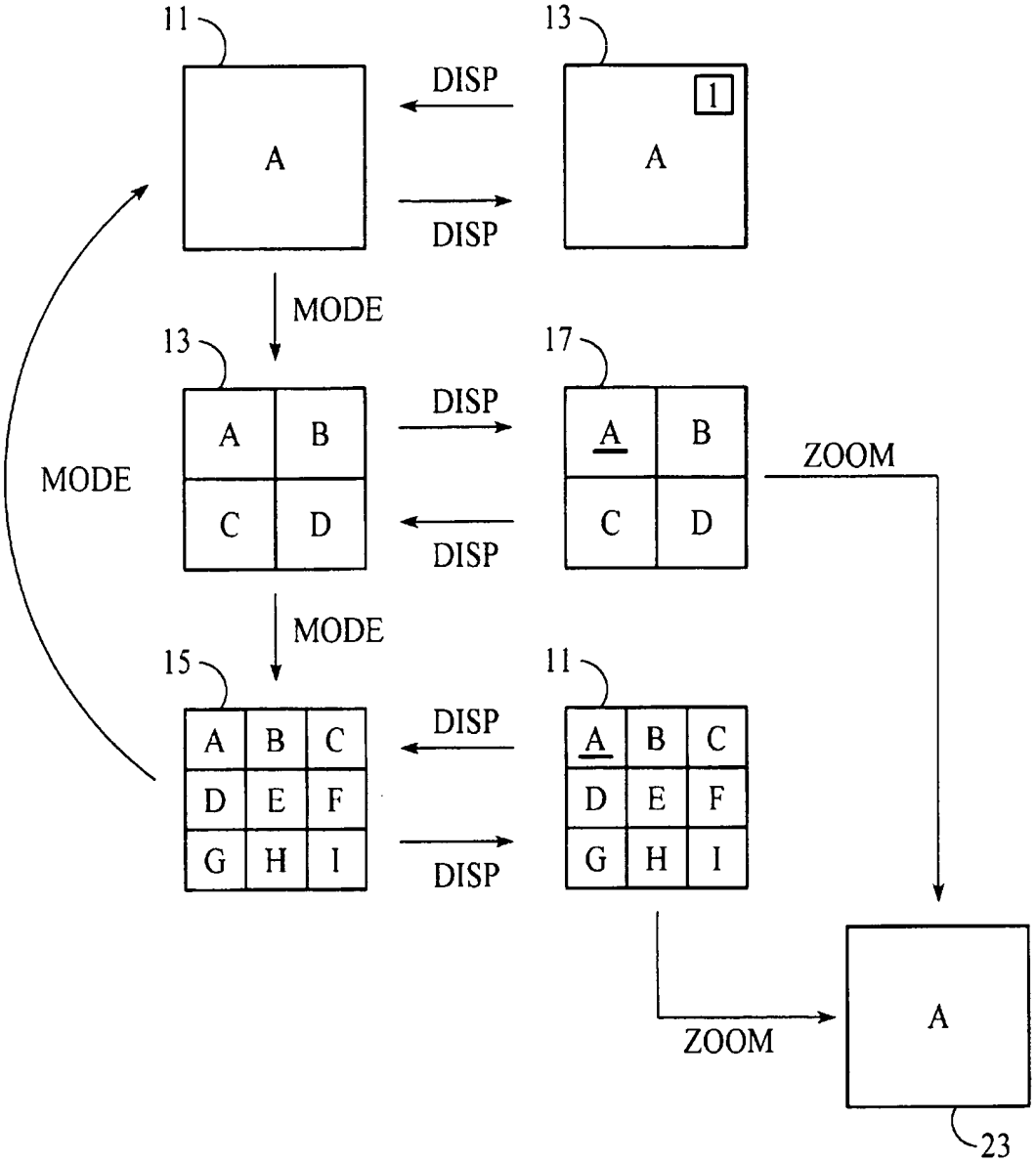


FIG. 2
(PRIOR ART)

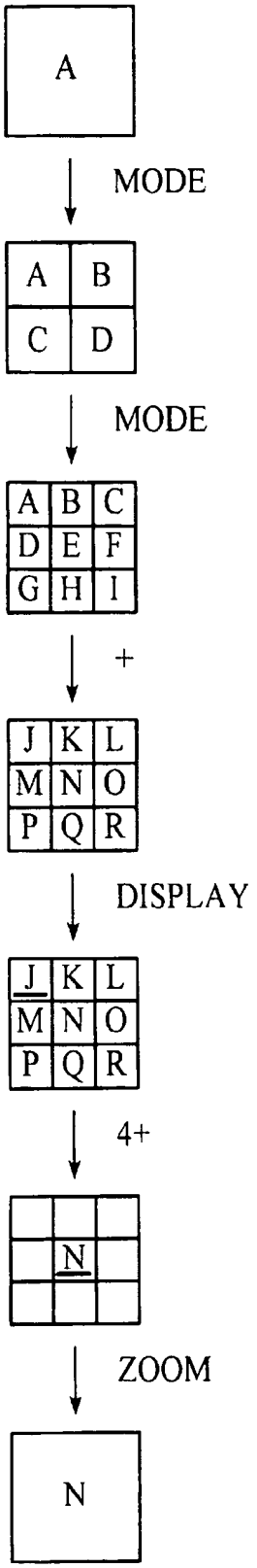


FIG. 3A
(PRIOR ART)

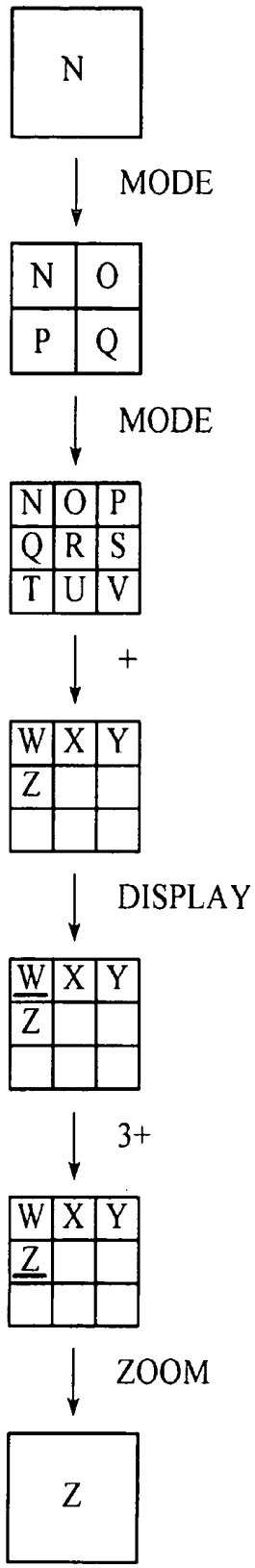


FIG. 3B
(PRIOR ART)

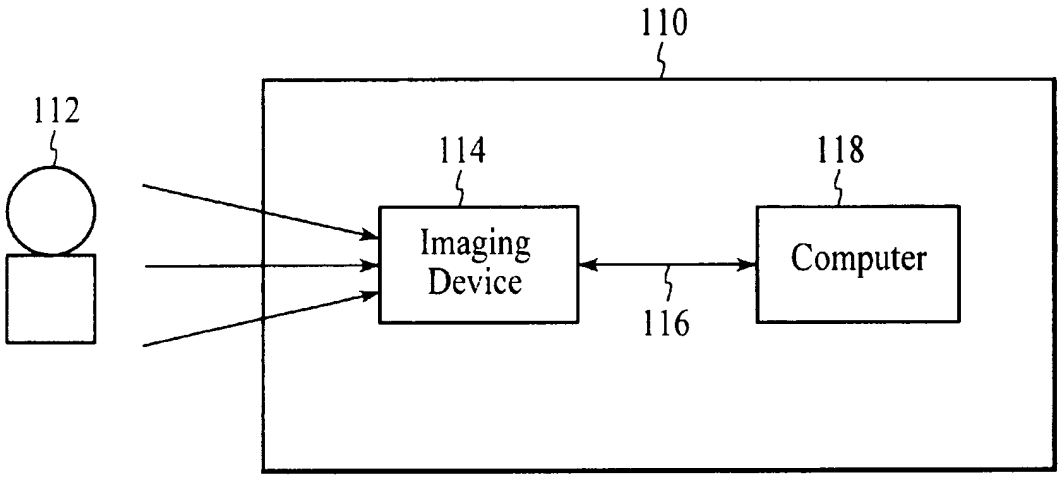


FIG. 4

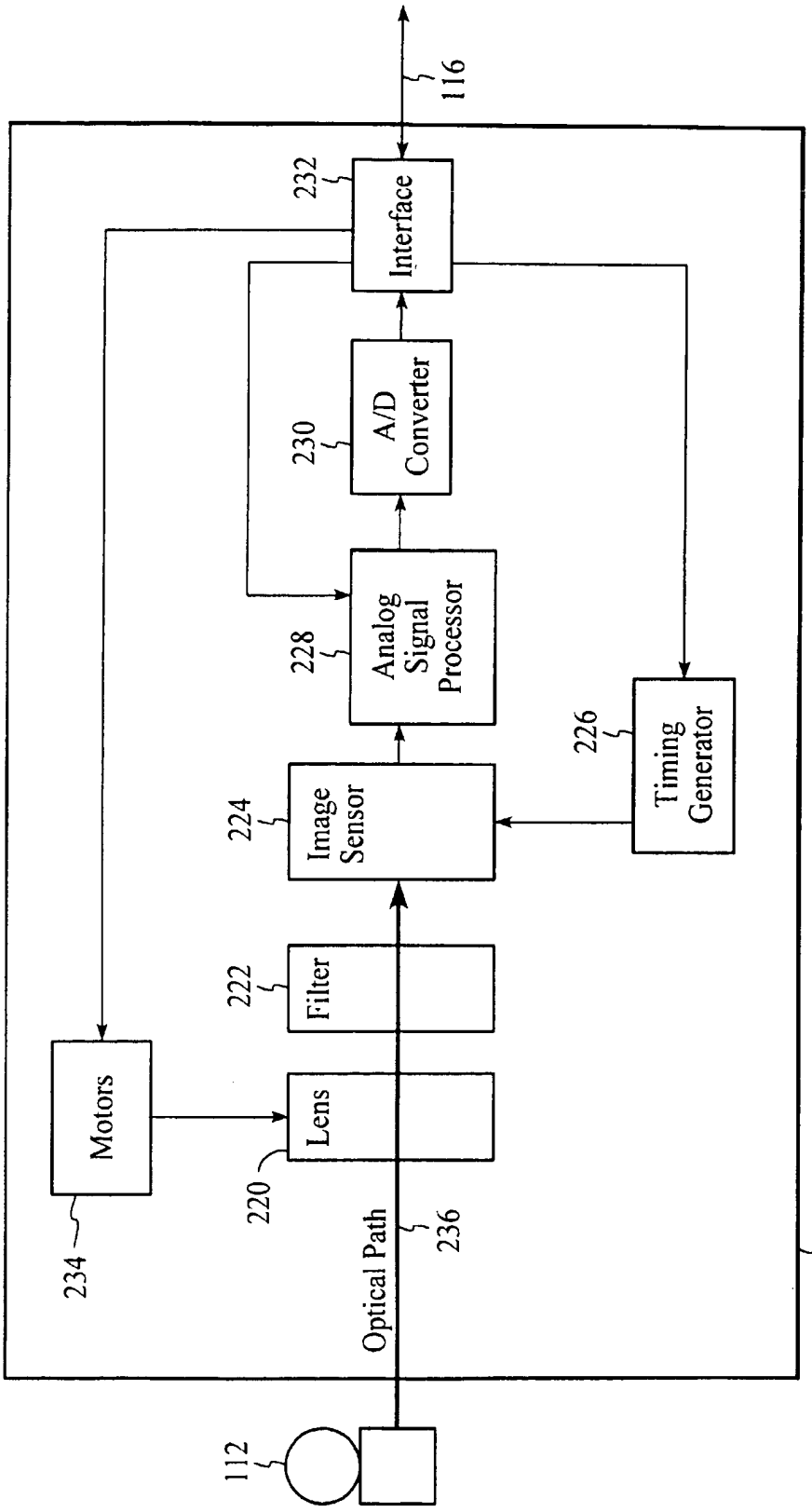

116
232
Interface
230
A/D Converter
228
Analog Signal Processor
226
Timing Generator
224
Image Sensor
222
Filter
220
Lens
234
Motors
236
Optical Path
112
114

FIG. 5

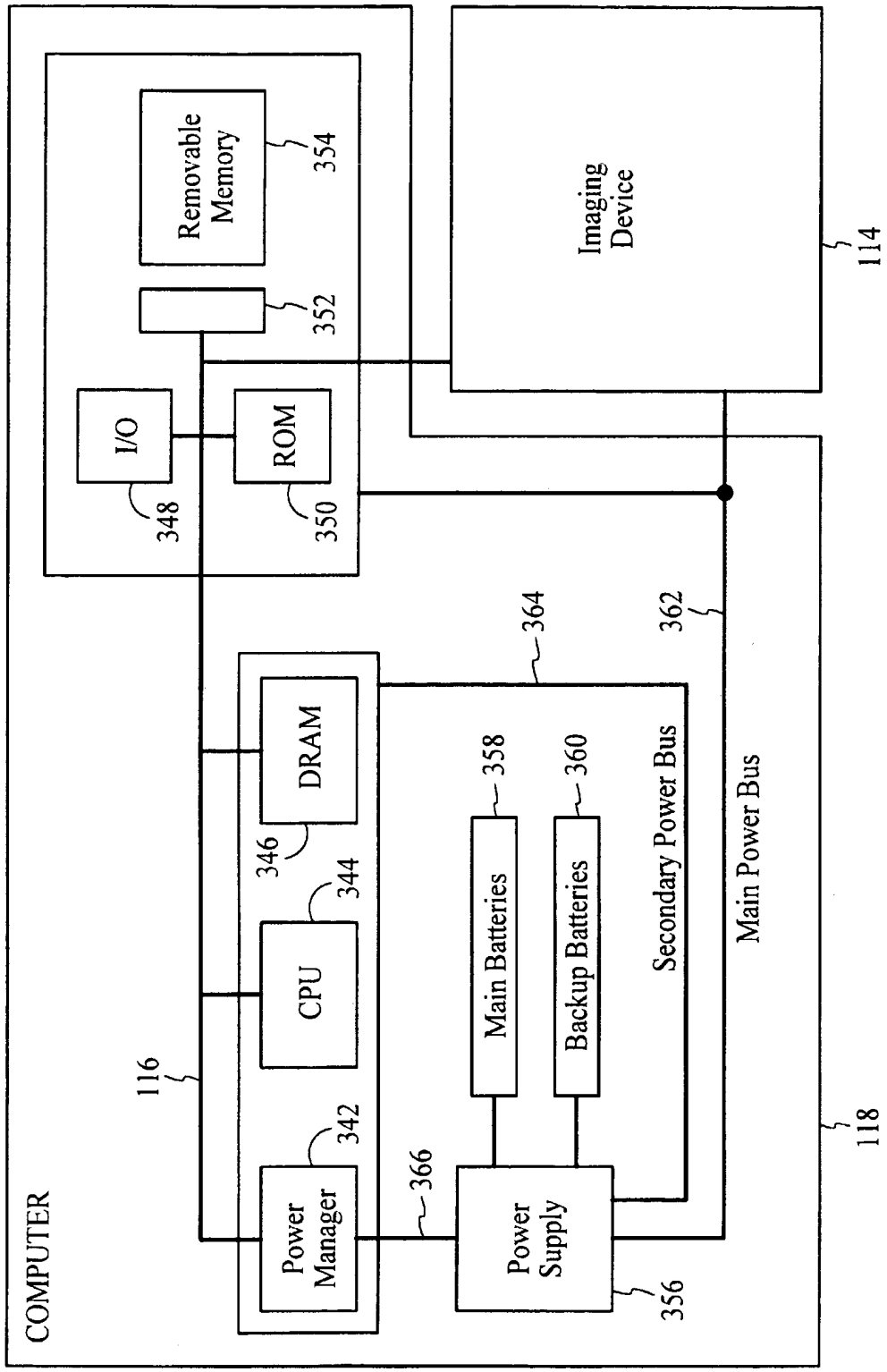
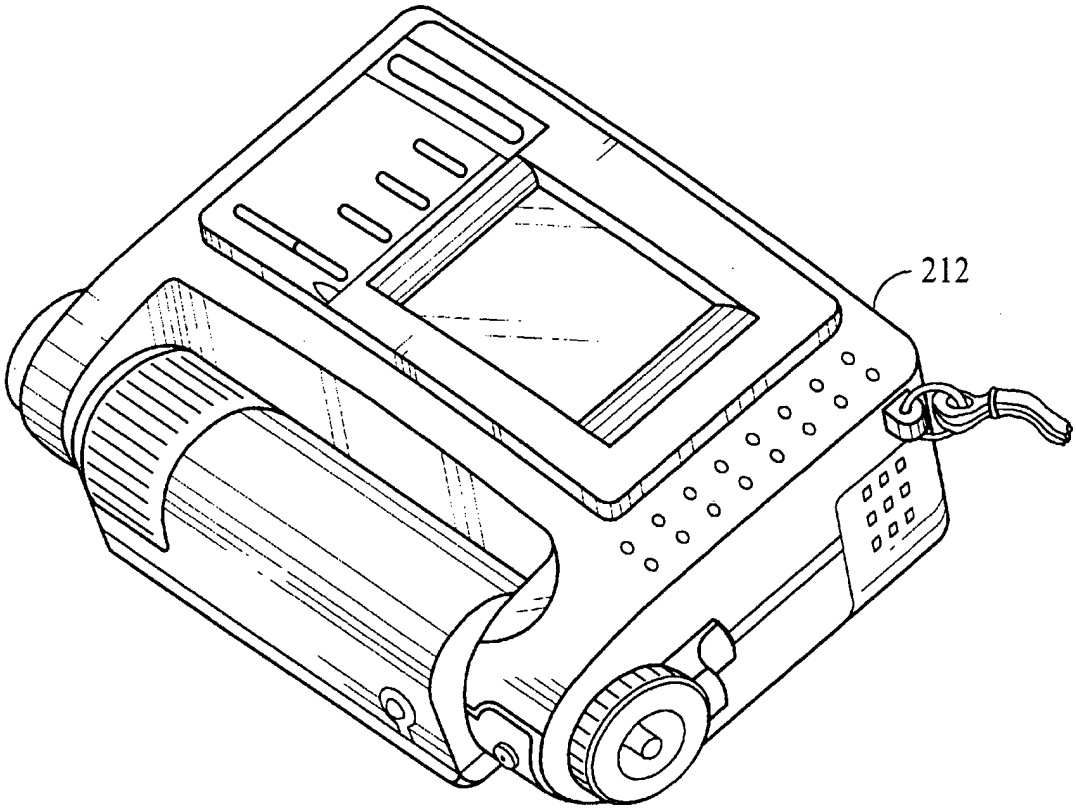

COMPUTER
Removable Memory
354
352
I/O
348
ROM
350
Imaging Device
114
DRAM
346
CPU
344
Power Manager
342
116
364
362
358
360
Main Batteries
Backup Batteries
Secondary Power Bus
Main Power Bus
366
Power Supply
356
118

FIG. 6



200

FIG. 7

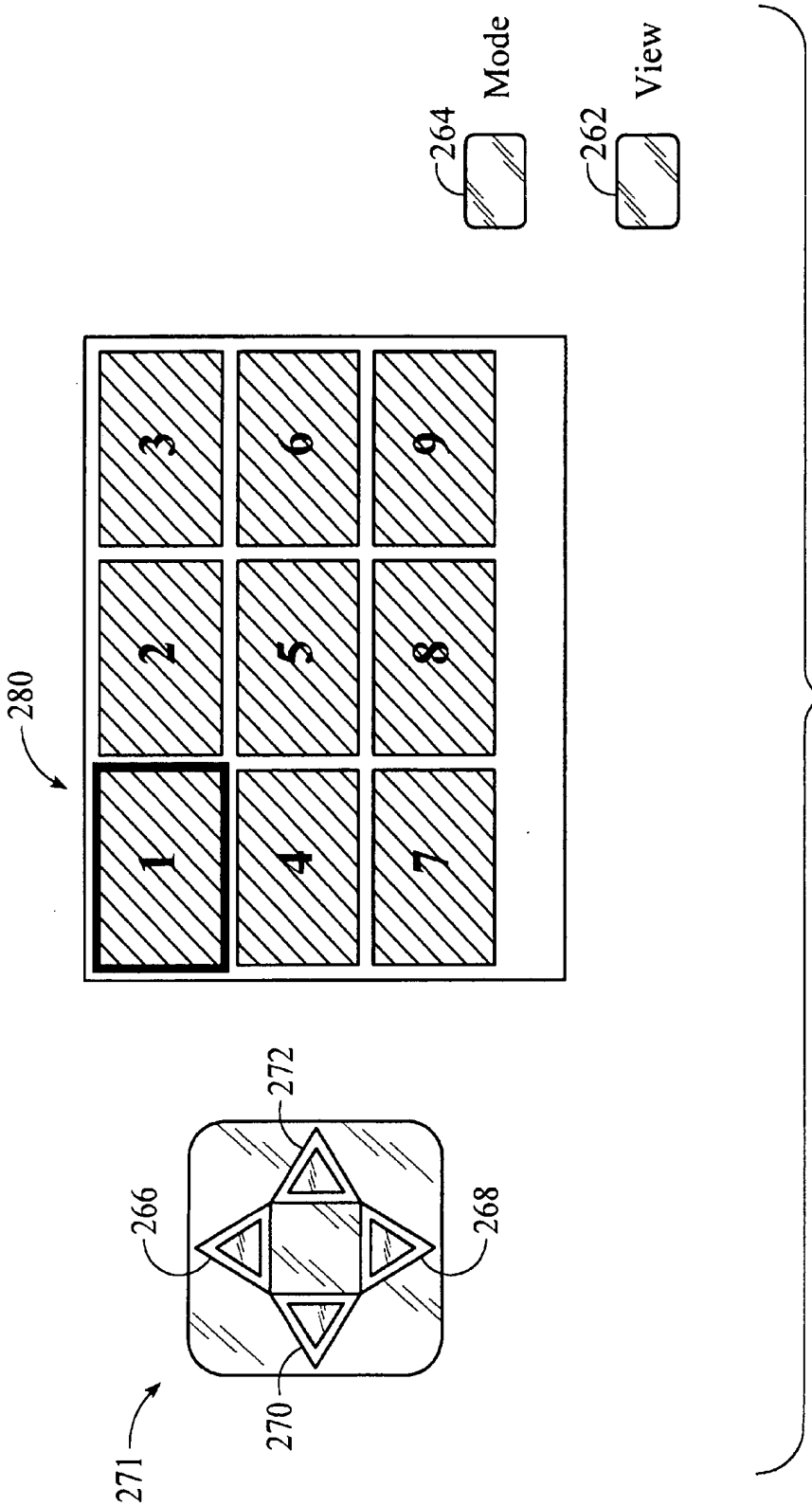


FIG. 8

FIG. 9

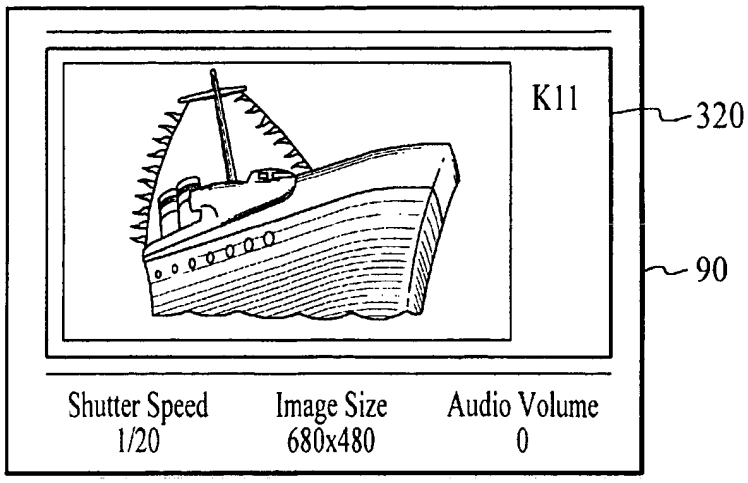


FIG. 10

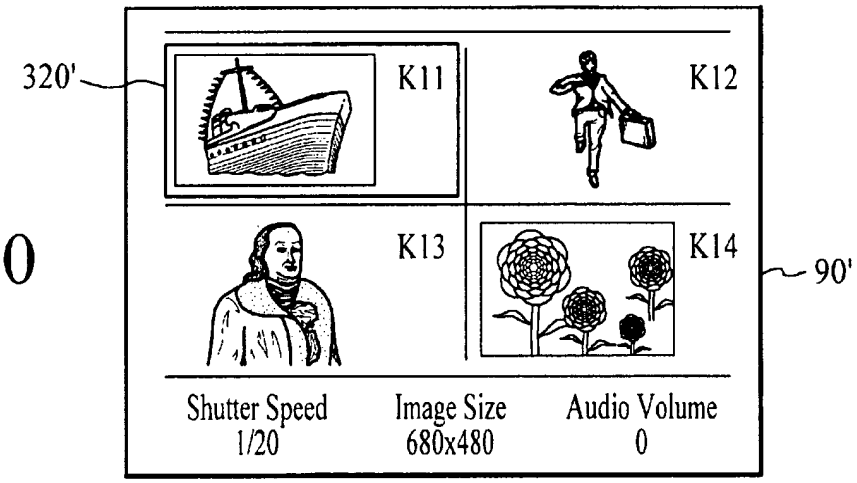
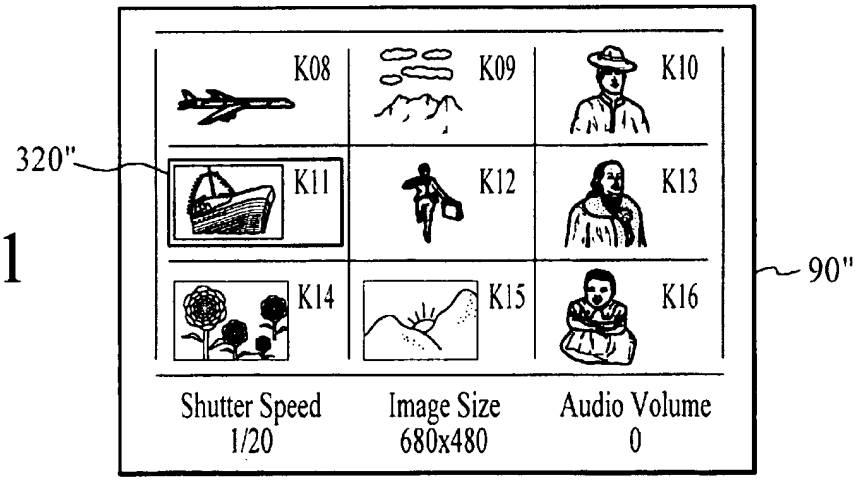


FIG. 11



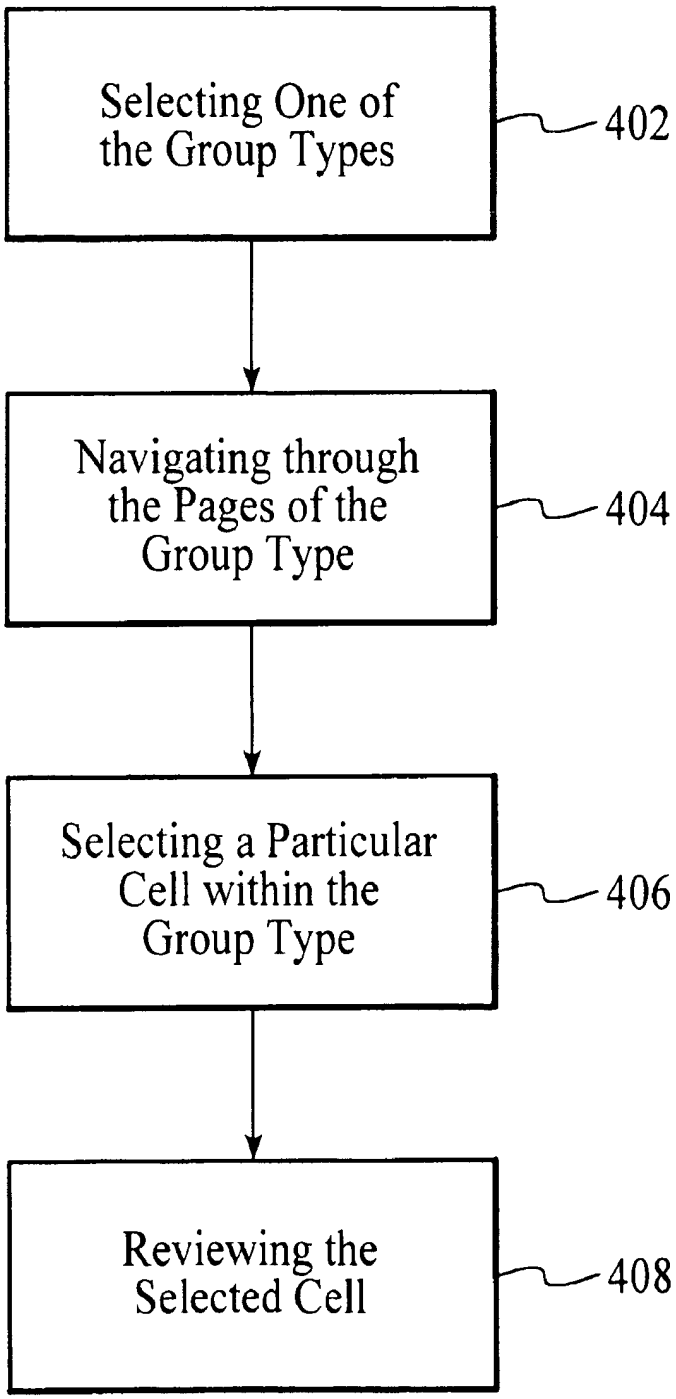

Selecting One of the Group Types
402
Navigating through the Pages of the Group Type
404
Selecting a Particular Cell within the Group Type
406
Reviewing the Selected Cell
408

FIG. 12

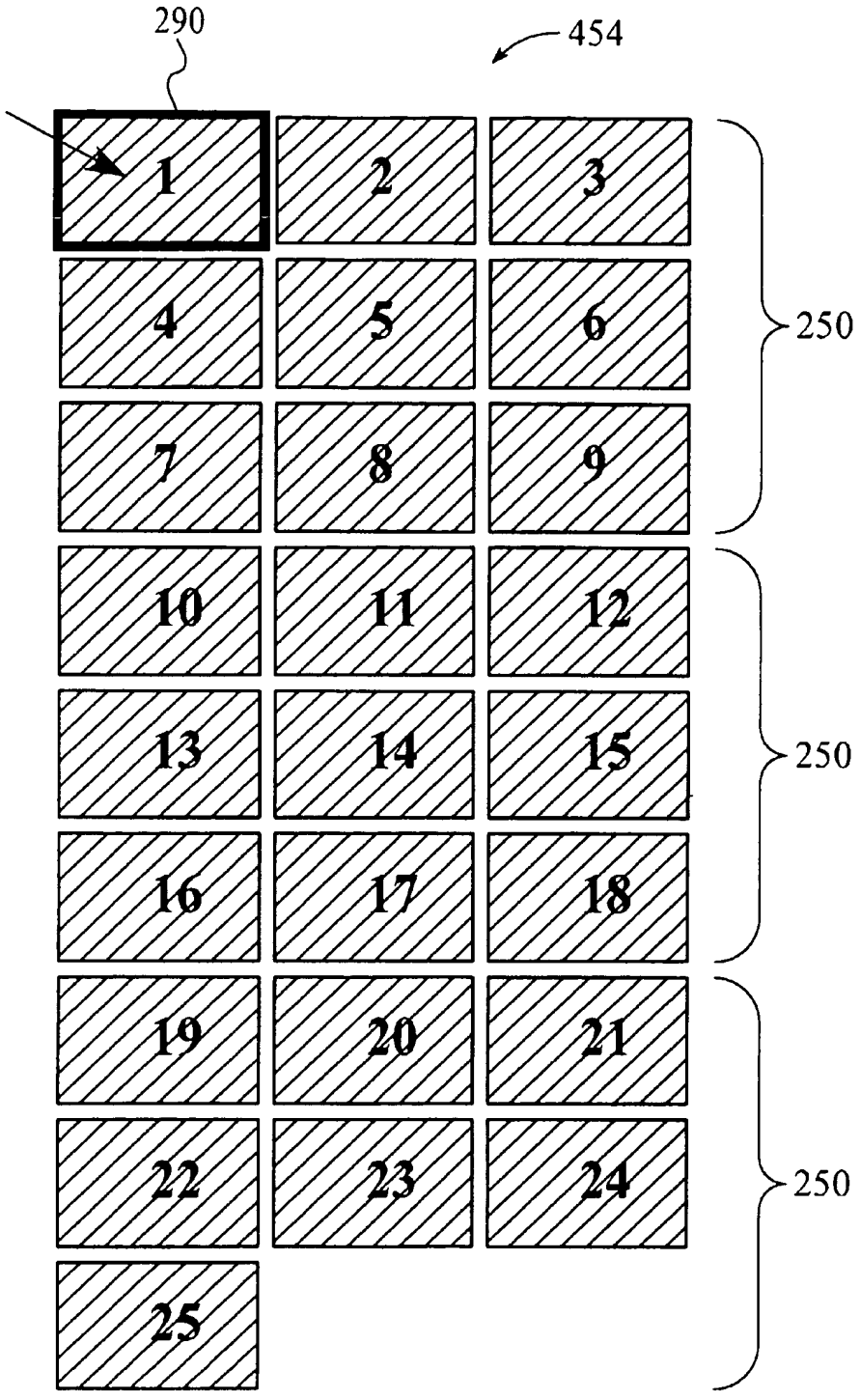

290
454
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
250
250
250

FIG. 12A

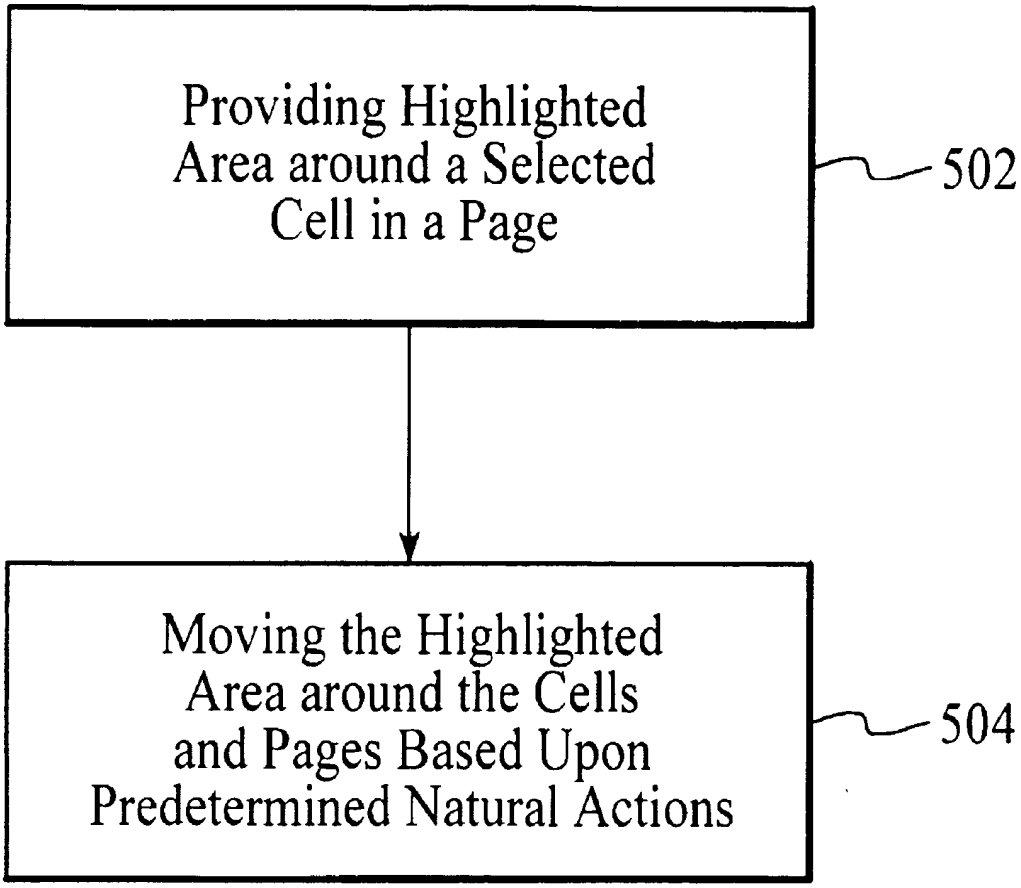

Providing Highlighted Area around a Selected Cell in a Page
502
Moving the Highlighted Area around the Cells and Pages Based Upon Predetermined Natural Actions
504

FIG. 13

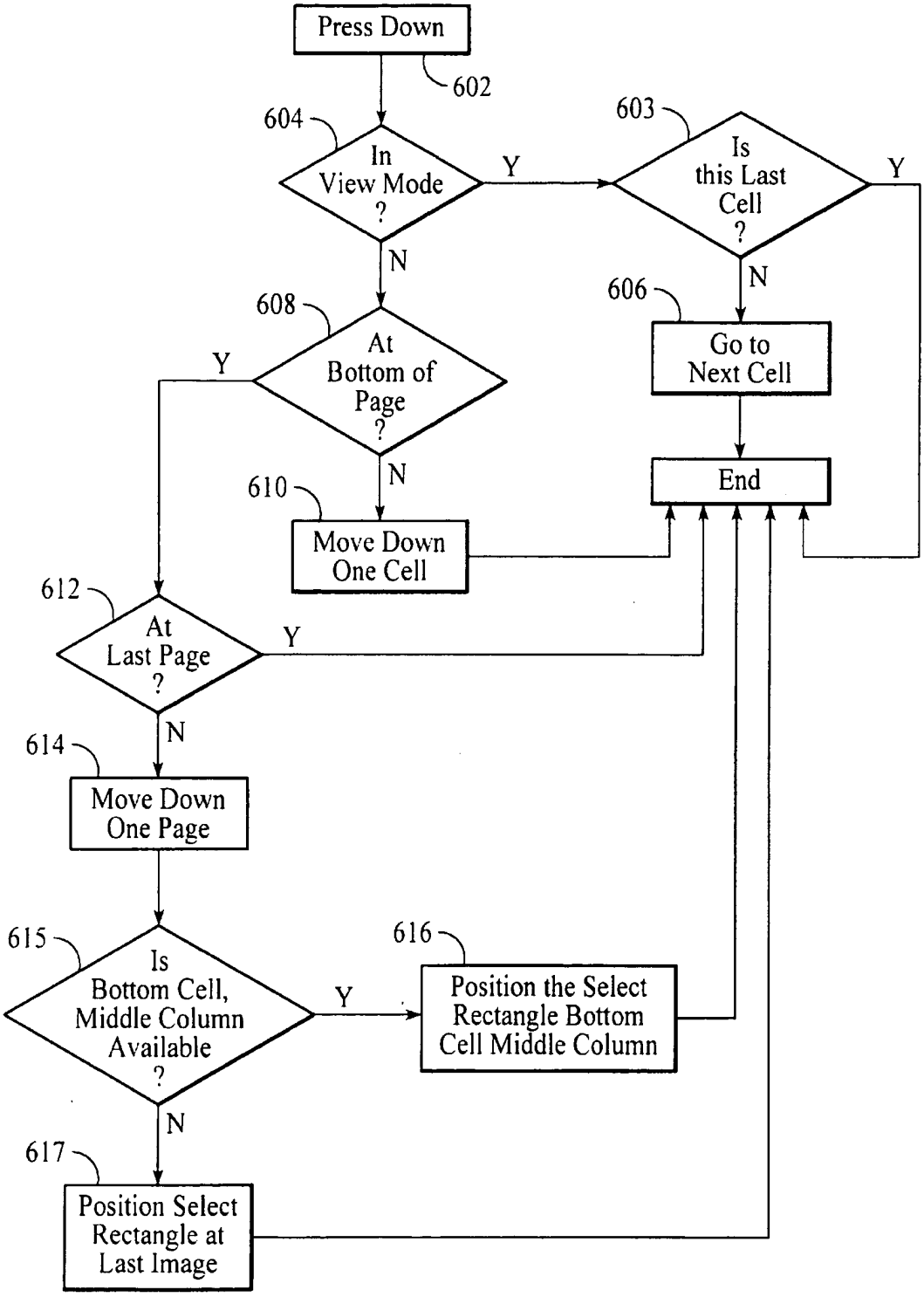

Press Down
602
604
In View Mode ?
Y
603
Is this Last Cell ?
Y
N
606
Go to Next Cell
608
At Bottom of Page ?
Y
N
End
610
Move Down One Cell
612
At Last Page ?
Y
N
614
Move Down One Page
615
Is Bottom Cell, Middle Column Available ?
Y
616
Position the Select Rectangle Bottom Cell Middle Column
N
617
Position Select Rectangle at Last Image

FIG. 14

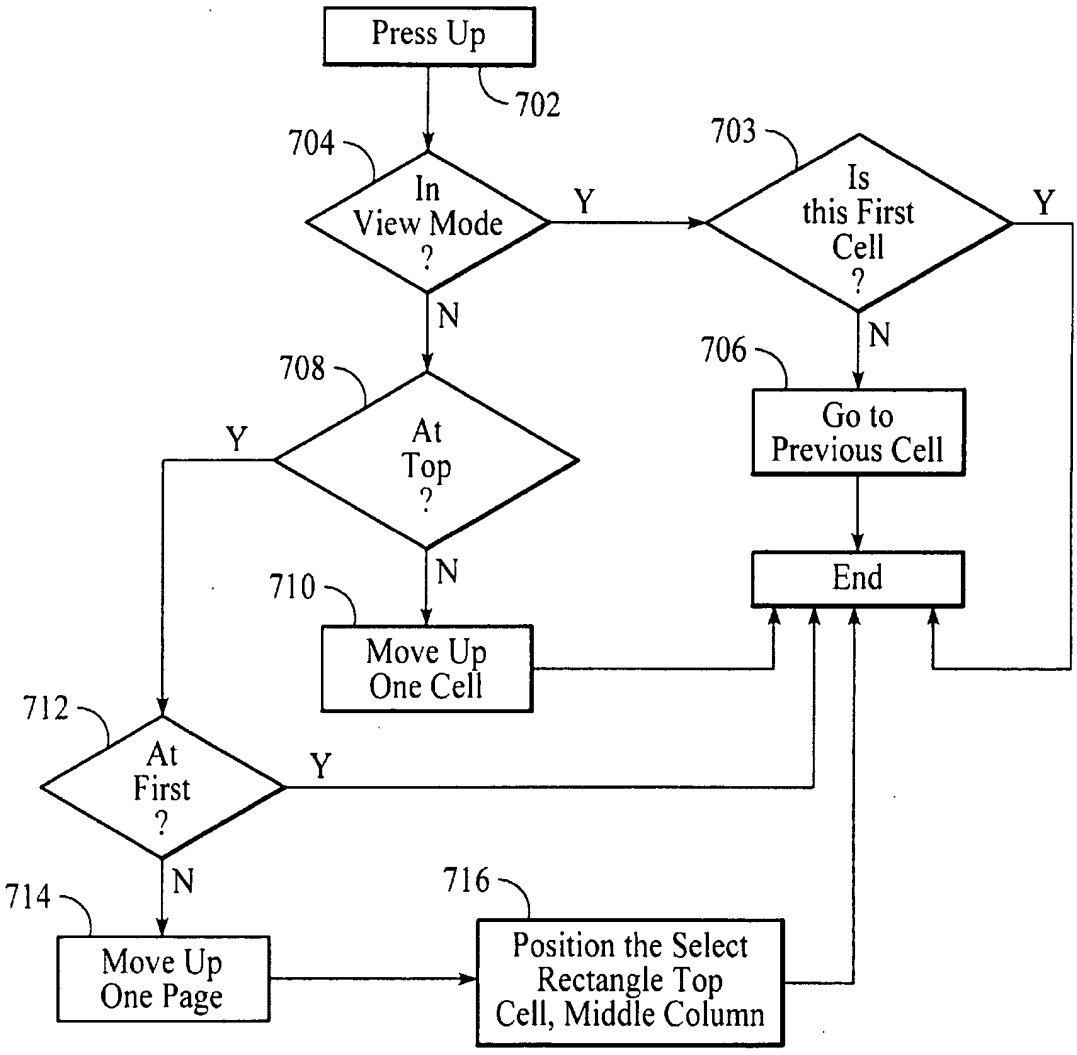

Press Up
702
704
In View Mode ?
Y
703
Is this First Cell ?
Y
N
N
706
Go to Previous Cell
708
At Top ?
Y
N
End
710
Move Up One Cell
712
At First ?
Y
N
714
Move Up One Page
716
Position the Select Rectangle Top Cell, Middle Column

FIG. 15

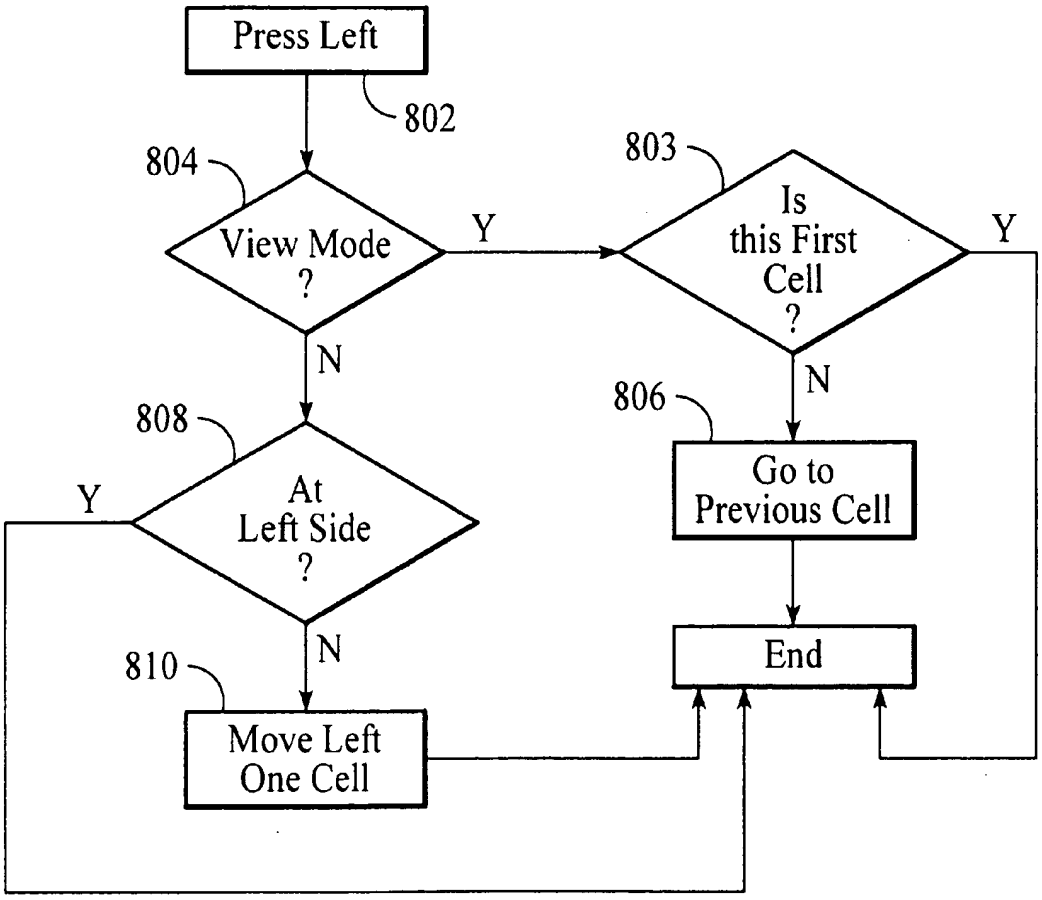

Press Left
802
804
View Mode ?
Y
803
Is this First Cell ?
Y
N
N
806
Go to Previous Cell
808
At Left Side ?
Y
N
End
810
Move Left One Cell

FIG. 16

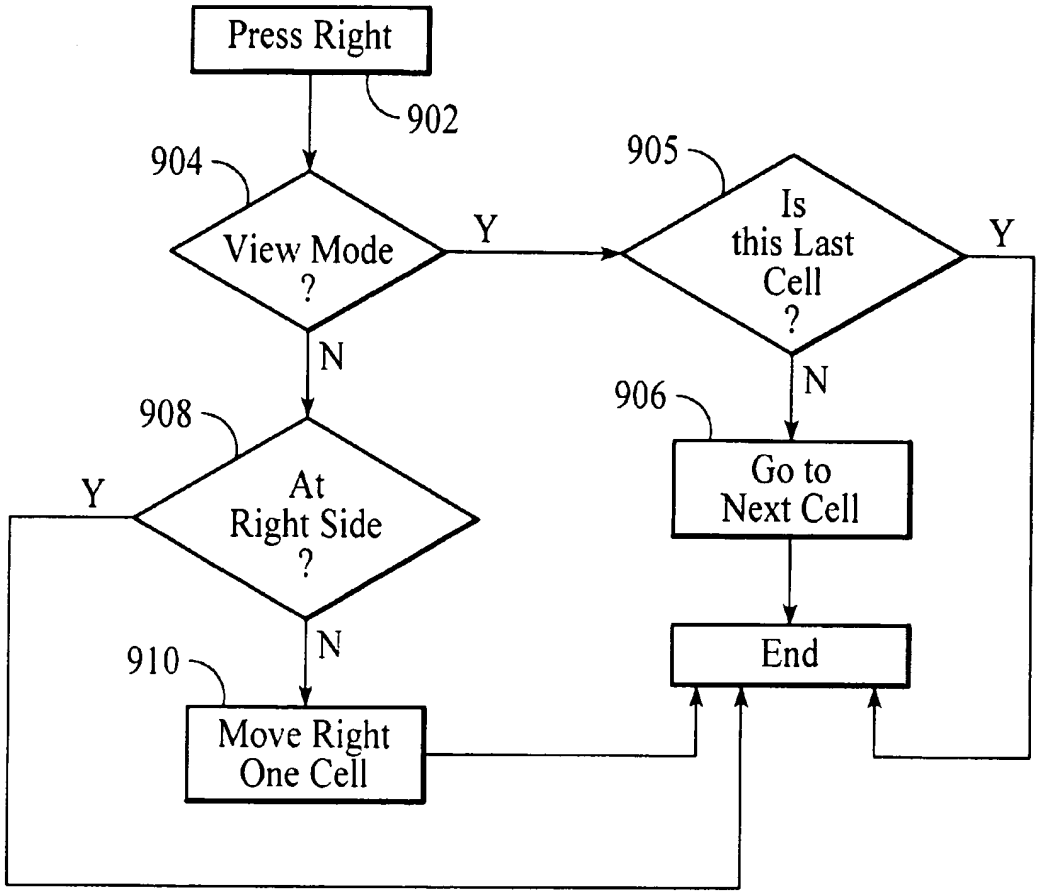

Press Right
902
904
View Mode ?
Y
905
Is this Last Cell ?
Y
N
N
906
908
Go to Next Cell
Y
At Right Side ?
N
910
End
Move Right One Cell

FIG. 17

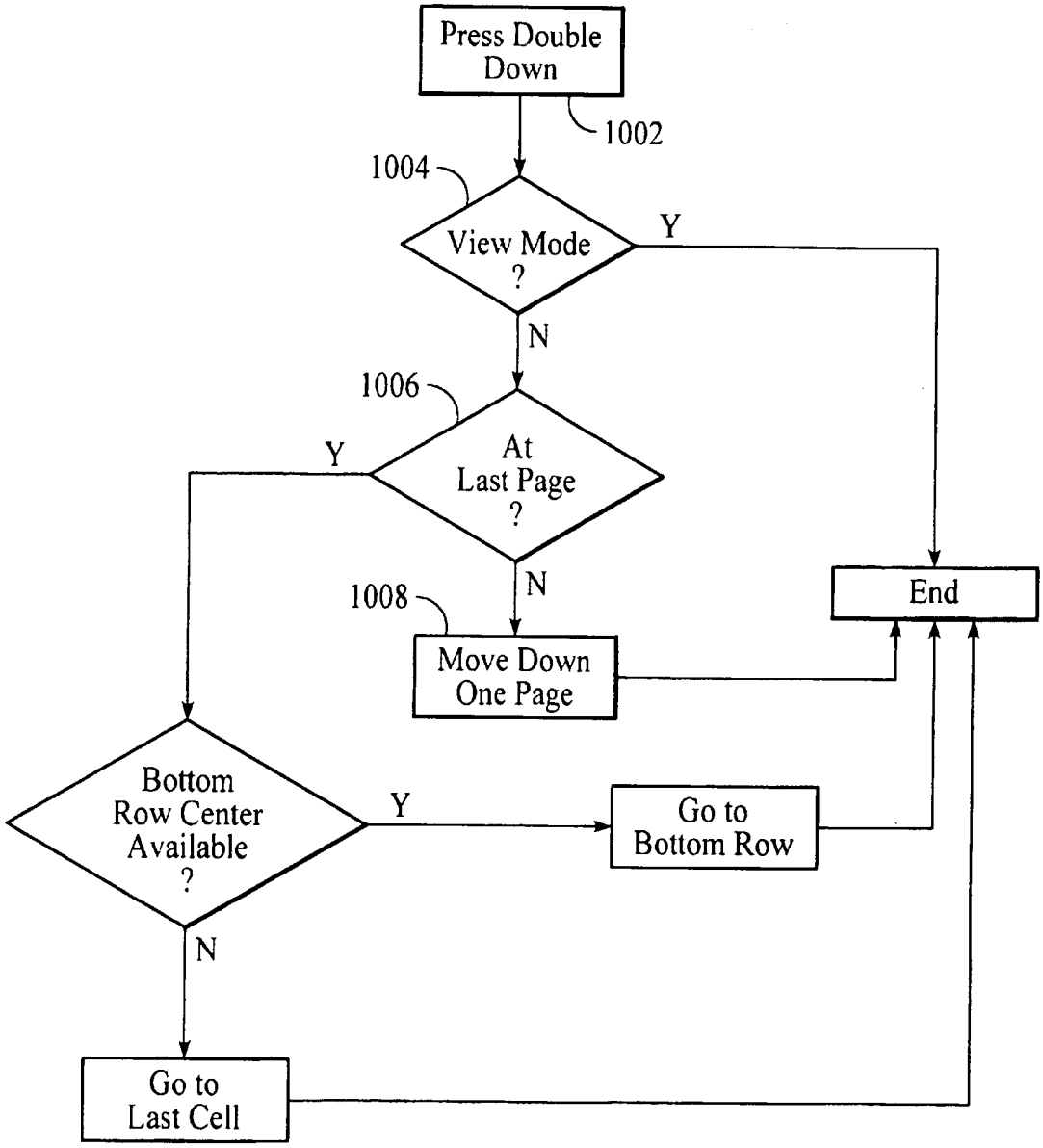

Press Double Down
1002
1004
View Mode ?
Y
N
1006
At Last Page ?
Y
N
1008
Move Down One Page
End
Bottom Row Center Available ?
Y
Go to Bottom Row
N
Go to Last Cell

FIG. 18

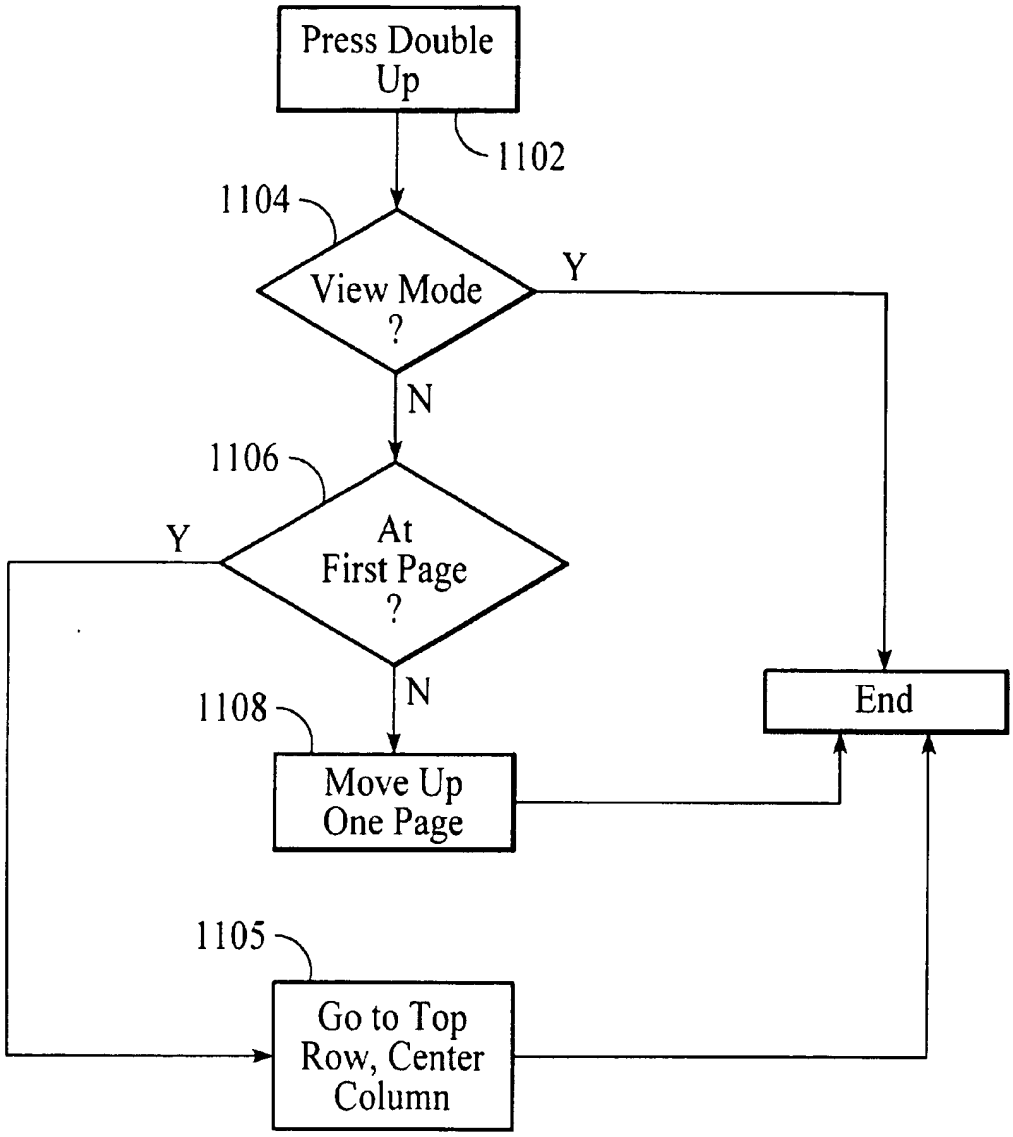

Press Double Up
1102
1104
View Mode ?
Y
N
1106
At First Page ?
Y
N
1108
Move Up One Page
End
1105
Go to Top Row, Center Column

FIG. 19

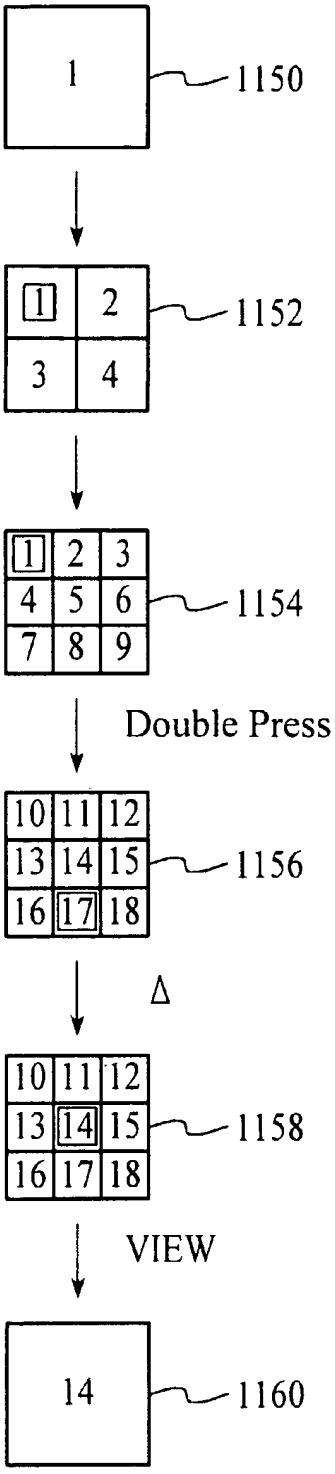

1
1150
1
2
3
4
1152
1
2
3
4
5
6
7
8
9
1154
Double Press
10
11
12
13
14
15
16
17
18
1156
Δ
10
11
12
13
14
15
16
17
18
1158
VIEW
14
1160

FIG. 20A

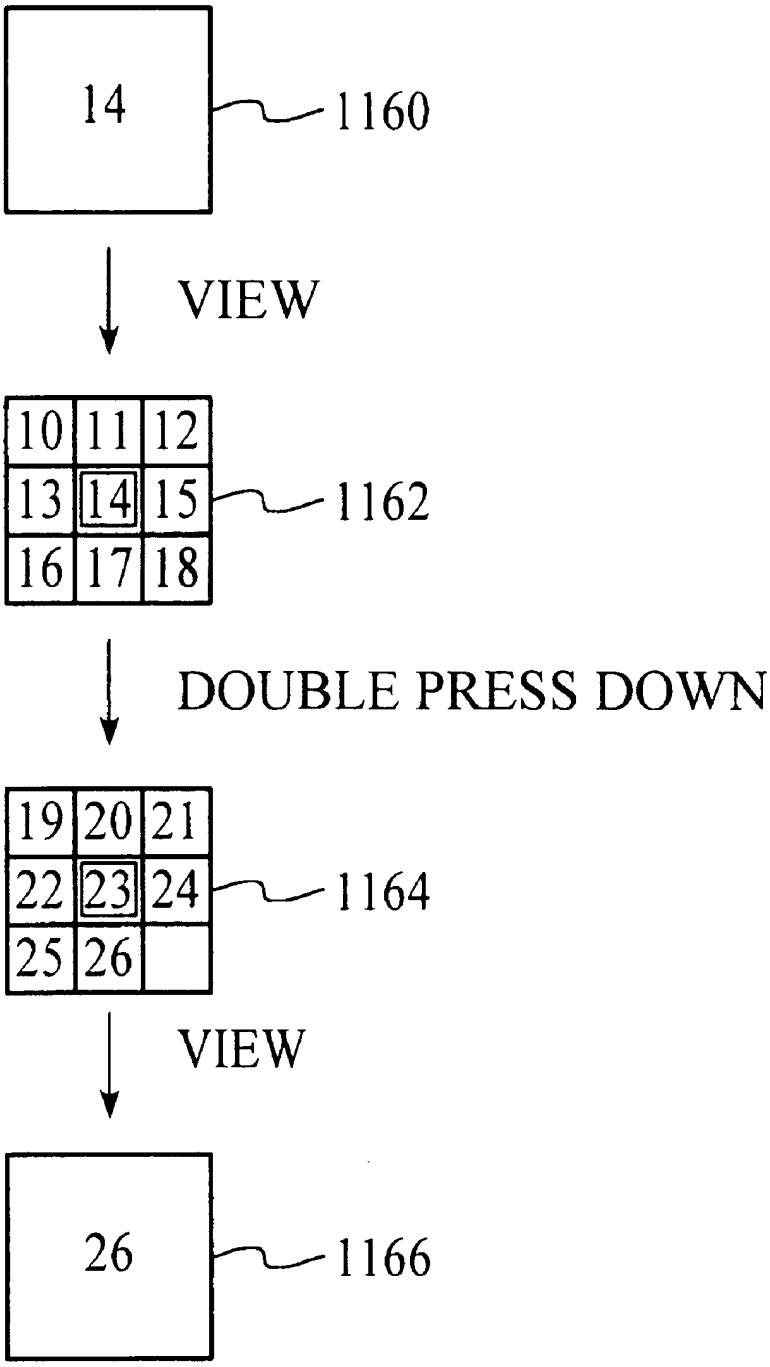

14
1160
VIEW
10 11 12
13 14 15
16 17 18
1162
DOUBLE PRESS DOWN
19 20 21
22 23 24
25 26
1164
VIEW
26
1166

FIG. 20B

METHOD AND SYSTEM FOR REVIEWING AND NAVIGATING AMONG IMAGES ON AN IMAGE CAPTURE UNIT

FIELD OF THE INVENTION

The present invention relates generally to a image capture unit and more particularly to a method and system for reviewing and navigating among images in such a unit.

BACKGROUND OF THE INVENTION

Digital cameras are utilized for taking pictures of scenes and the like. Some digital cameras include a display screen to display images after the picture has been taken. Digital cameras which include a display screen oftentimes have the ability to display group types of images at the same time. For example, a digital camera may display a group type of one image, a group type of four images, a group type of nine images at the same time. Each of the group types includes a plurality of pages where a page is the number of images on a display at one time (in this case 1, 4 or 9 images). In such a camera there is also the ability to navigate from one image or cell to another or from one page of images of the group type to another page of images of the group type. When we refer to one page of images, what is meant by that is one page of four to the next page of four, one page of nine to the next page of nine, and so on and so forth. There is oftentimes the ability in such digital cameras to move between group types via a mode button. What is meant by this, for example, is that it is possible through such a mode button to move between one single image to a group type of four images to a group type of nine images. Oftentimes in these types of digital cameras, the reviewing and navigating within a plurality of images via a particular group type (i.e. 1, 4 and 9) and also between the pages of images via the mode button are complex and unnatural. In addition, in some situations, a large number of keystrokes are necessary to view a selected image.

To more particularly describe some of the problems with previous displays in digital cameras, such as the display in a Casio QV10 camera, refer now to the following discussion in conjunction with FIG. 1. FIG. **1** shows a conventional digital camera display which includes a zoom button **3**, a display button **5**, a mode button **7**, and a forward-reverse button **9**. In such a camera the display button **5** allows one to switch between page and image mode to look at a particular image (Image A). The zoom button **3** allows one to proceed from a small image to a full size of a selected image, the mode button allows one to select different group types and the forward-reverse button **9** allows one to go from one image to an earlier image or a later image or earlier or later page.

FIG. **2** shows, the interaction between the different buttons to allow for the display of images in different formats. Initially, if in the group type one mode or one image per display, the forward and reverse button would allow one to go forward one image or back one image (block **11**). If the mode button is pressed one time, then, for example, four images, A, B, C and D are each displayed (block **13**). The forward and reverse buttons now provide for one page of four forward, one page of four back. If the mode button is pressed again, nine images are displayed (block **15**) (A, B, C, D, E, F, G, H, I). The forward and reverse buttons now provide for one page of nine forward, one page of nine back. To go back to the first mode, the zoom button would be pressed to go back to image A as shown in block **23** only if the display button is pressed first. Otherwise the mode button is pressed. If the display of a particular image is desired, the display button would be pressed. Initially, an indication of a selected image is provided via underlining shown in blocks **13** and **17** (in this case A). The forward-reverse buttons are used to proceed to the next image within the group type highlighted by the underline. If, for example, you wanted to display a selected image from the nine mode, then the zoom button would be pressed and the single image would be displayed.

However, as is seen, there is a complex interaction of zoom, display mode and forward-reverse to provide the appropriate images. This approach is not natural and requires many keystrokes in certain applications.

To more clearly illustrate this, referring now to FIG. **3A**, what is shown is the selection of a fourteenth image from an image capture unit using the elements as described above. First, if the mode button would be pressed twice, as shown, to proceed to the mode where there are nine images being displayed at one time. Then the forward button is pressed to proceed to the next page. Then the display must be pressed. Then the forward button is then pressed four times to select the fourteenth image. Finally, the zoom button is pressed so that the desired image is now displayed. As is seen, this process requires nine keystrokes.

FIG. **3B** shows the selection of the twenty-sixth image of the display proceeding from the fourteenth image. To select the twenty-sixth image, first the mode button must be pressed to return to the four mode. As is seen, image (N) **14** is now in a first position in top row rather than its original middle position of the second row. The mode button is then pressed again. Next, the plus button is pressed to proceed to the page that has the twenty-sixth (Z) image. The display button is pressed to underline the first image of the page (image twenty-three). The plus button is then pressed three additional times to select the twenty-sixth image. Thereafter, the zoom button is pressed to display the image. As is seen, eight additional keystrokes are required to proceed to display the twenty-sixth image. This can become time consuming and tedious for a user of the image capture device. In addition the process for obtaining a particular image is not a natural one and requires learning a particular protocol.

Accordingly, the conventional systems not only require more keystrokes, they are also less natural because different buttons have different functions dependent upon where a user is within the process.

There is a need, therefore to be able to provide images on a display device which will allow for the user to review various images that have been taken, while at the same time provide a display and readout of a particular image in an expeditious and straightforward manner. For example, after taking several pictures it would be useful to identify a particular picture quickly, with the minimum of effort and at the same time be able to refer to another picture in the same manner. It is also important to provide for more efficient ways to quickly navigate through a series of images. The system should be implementable in a simple and cost effective fashion and should be easily handled by a user.

The present invention addresses such a need.

SUMMARY OF THE INVENTION

A method and system for reviewing and navigating through images displayed on an image capture unit is disclosed. A method and system comprises images in an image capture unit comprising displaying images in a predetermined number of group types. Each of the group types indicates a number of images to be displayed at a time. The

number of images displayed at a time comprising a page of images. The method includes selecting one group type from the predetermined number of group types and navigating through a plurality of images within the group type through the use of a highlighting area surrounding an image to be selected. Finally, the method and system includes selecting a particular image within the group type based upon the highlighted area.

In one aspect, the method and system includes a four-way button to facilitate ease of movement between an image or cell and between pages of images. It also includes a mode button which allows for movement between group types and a view button to facilitate viewing of a particular image. In addition, a method and system in accordance with the present invention allows for more natural movement for selection through the use of the four-way button in conjunction with the other buttons. Accordingly, navigation through images can be accomplished in a more expeditious fashion.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a diagram of a conventional digital camera.

FIG. **2** is a diagram that shows the interaction between the buttons in the digital camera.

FIG. **3A** shows the process of the selection of a fourteenth image using the digital camera of FIG. **1**.

FIG. **3B** shows the process of selection of the twenty-sixth image using the digital camera of FIG. **1**.

FIG. **4** is a block diagram of a preferred embodiment of the system of the present invention for reviewing and editing images on a digital camera.

FIG. **5** is a block diagram of a preferred embodiment of the digital camera of the present invention.

FIG. **6** is a block diagram of a preferred embodiment of a computer of the present invention.

FIG. **7** is a perspective view of a digital camera.

FIG. **8** is a front view of a digital camera.

FIGS. **9** through **11** are displays of group types **90**, **90'** and **90"** that provide one, four and nine images displayed on the screen in accordance with the present invention.

FIG. **12** is a flow chart of the operation for displaying and editing process in accordance with the present invention.

FIG. **12A** is a diagram showing plurality of pages of images including a selection rectangle.

FIG. **13** is a flow chart of the navigation step of FIG. **12** in accordance with the present invention.

FIG. **14** is a flow chart showing navigation by pressing the down button when the selection rectangle is in a certain position.

FIG. **15** is a flow chart showing navigation by pressing the up button when the selection rectangle is in a certain position.

FIG. **16** is a flow chart showing navigation by pressing the left button.

FIG. **17** is a flow chart showing navigation by pressing the right button.

FIG. **18** is a flow chart showing navigation by double pressing the down button.

FIG. **19** is a flow chart showing navigation by double pressing the up button.

FIG. **20A** is a diagram showing the selection of the fourteenth image in accordance with the present invention.

FIG. **20B** is a diagram showing the selection of the twenty-sixth image in accordance with the present invention.

DESCRIPTION OF THE INVENTION

The present invention relates to a method and system for reviewing and navigating through images on an image capture unit. The following description is presented to enable one of ordinary skill in the art to make and use the invention and is provided in the context of a patent application and its requirements. Various modifications to the preferred embodiment will be readily apparent to those skilled in the art and the generic principles herein may be applied to other embodiments. Thus, the present invention is not intended to be limited to the embodiment shown but is to be accorded the widest scope consistent with the principles and features described herein.

The present invention will be described in the context of digital camera. However, one of ordinary skill in the art should recognize the present invention has wide application in other environments. That is, any product which displays images; icons or other items, could incorporate the features described hereinbelow and that product would be within the spirit and scope of the present invention. The description as it relates to the digital cameras is illustrative in nature only is provided to allow one of ordinary skill in the art to fully understand the advantages of the present invention. Accordingly, the present invention is not limited to the specific embodiments shown and should be accorded the broadest scope consistent with the principles describe herein.

Referring now to FIG. **4**, a block diagram of a camera **110** is shown according to the present invention. Camera **110** preferably comprises an imaging device **114**, a system bus **116** and a computer **118**. Imaging device **114** is optically coupled to an object **112** and electrically coupled via system bus **116** to computer **118**. Once a photographer has focused imaging device **114** on object **112** and, using a capture button or some other means, instructed camera **110** to capture an image of object **112**, computer **118** commands imaging device **114** via system bus **116** to capture raw image data representing object **112**. The captured raw image data is transferred over system bus **116** to computer **118** which performs various image processing functions on the image data before storing it in its internal memory. System bus **116** also passes various status and control signals between imaging device **114** and computer **118**.

Referring now to FIG. **5**, a block diagram of the preferred embodiment of imaging device **114** is shown. Imaging device **114** preferably comprises a lens **220** having an iris, a filter **222**, an image sensor **224**, a timing generator **226**, an analog signal processor (ASP) **228**, an analog-to-digital (A/D) converter **230**, an interface **232**, and one or more motors **234**.

U.S. patent application Ser. No. 08/355,031, entitled "A System and Method For Generating a Contrast Overlay as a Focus Assist for an Imaging Device," filed on Dec. 13, 1994, is incorporated herein by reference and provides a detailed discussion of the preferred elements of imaging device **114**. Briefly, imaging device **114** captures an image of object **112** via reflected light impacting image sensor **224** along optical path **236**. Image sensor **224** responsively generates a set of raw image data representing the captured image **112**. The raw image data is then routed through ASP **228**, A/D converter **230** and interface **232**. Interface **232** has outputs for controlling ASP **228**, motors **234** and timing generator **226**. From interface **232**, the raw image data passes over system bus **116** to computer **118**.

Referring now to FIG. **6**, a block diagram of the preferred embodiment for computer **118** is shown. System bus **116**

provides connection paths between imaging device **114**, power manager **342**, central processing unit (CPU) **344**, dynamic random-access memory (DRAM) **346**, input/output interface (I/O) **348**, read-only memory (ROM) **350**, and buffers/connector **352**. Removable memory **354** connects to system bus **116** via buffers/connector **352**. Alternately, camera **110** may be implemented without removable memory **354** or buffers/connector **352**.

Power manager **342** communicates via line **366** with power supply **356** and coordinates power management operations for camera **110**. CPU **344** typically includes a conventional processor device for controlling the operation of camera **110**. In the preferred embodiment, CPU **344** is capable of concurrently running multiple software routines to control the various processes of camera **110** within a multi-threading environment. DRAM **346** is a contiguous block of dynamic memory which may be selectively allocated to various storage functions.

I/O **348** is an interface device allowing communications to and from computer **118**. For example, I/O **348** permits an external host computer (not shown) to connect to and communicate with computer **118**. I/O **348** also permits a camera **110** user to communicate with camera **110** via an external user interface and via an external display panel, referred to as a view finder.

ROM **350** typically comprises a conventional nonvolatile read-only memory which stores a set of computer-readable program instructions to control the operation of camera **110**. Removable memory **354** serves as an additional image data storage area and is preferably a non-volatile device, readily removable and replaceable by a camera **110** user via buffers/connector **352**. Thus, a user who possesses several removable memories **354** may replace a full removable memory **354** with an empty removable memory **354** to effectively expand the picture-taking capacity of camera **110**. In the preferred embodiment of the present invention, removable memory **354** is typically implemented using a flash disk.

Power supply **356** supplies operating power to the various components of camera **110**. In the preferred embodiment, power supply **356** provides operating power to a main power bus **362** and also to a secondary power bus **364**. The main power bus **362** provides power to imaging device **114**, I/O **348**, ROM **350** and removable memory **354**. The secondary power bus **364** provides power to CPU **344** and DRAM **346**.

Power supply **356** is connected to main batteries **358** and also to backup batteries **360**. In the preferred embodiment, a camera **110** user may also connect power supply **356** to an external power source. During normal operation of power supply **356**, the main batteries **358** provide operating power to power supply **356** which then provides the operating power to camera **110** via both main power bus **362** and secondary power bus **364**. Power manager **342** always receives power when both main or back up batteries are installed as external power is applied.

During a power failure mode in which the main batteries **358** have failed (when their output voltage has fallen below a minimum operational voltage level) the backup batteries **360** provide operating power to power supply **356** which then provides the operating power only to the secondary power bus **364** of camera **110** and to the power manager **364**. Selected components of camera **110** (including DRAM **346**) are thus protected against a power failure in main batteries **358**.

Power supply **356** preferably also includes a flywheel capacitor connected to the power line coming from the main batteries **358**. If the main batteries **358** suddenly fail, the flywheel capacitor temporarily maintains the voltage from the main batteries **358** at a sufficient level, so that computer **118** can protect any image data currently being processed by camera **110** before shutdown occurs.

Typically, a display can be utilized to allow the user to review the images captured. To more specifically describe such an image, refer now to FIGS. **7** and **8**, which are perspective view and front view, respectively, of a digital camera **200**. As is seen in these views, the display **212** includes a view button **262** and a mode button **264**. The mode button **264** provides for displaying a plurality of images on the display. In a preferred embodiment the mode button **264** would allow for one or an array of images to be displayed at one time. In addition, there is a four way navigation control **271** which includes an up button **266**, down button **268**, left button **270**, and right button **272** which functions will be described in detail hereinafter.

Initially one image is displayed on a display screen **280**, by pressing the mode button **264** a first time four images are displayed on the display **280** and by pressing the mode button **264** again, nine images would be displayed. It should be understood, however, that the number of images per page and the number of group types could be any number and their use would be within the spirit and scope of the present invention.

Referring now to FIGS. **9** through **11**, what is shown are group types **90**, **90'** and **90"** that provide one, four and nine images displayed on the screen. On each of these group type **90** there is a highlighted area which encircles a particular image or "cell" indicated by **320**, **320'** and **320"**, respectively, which indicates a particular image that cat be viewed in more detail. This highlighted area in this embodiment is a rectangular which allows for quick and easy identification of the image selected. One of ordinary skill in the art recognizes that selection highlighting could be oval, circular or a plurality of other shapes and its use would be within the spirit and scope of the present invention. This highlighting is controlled by the up, down, right and left buttons **266–272** (FIG. **5**) to select the proper image.

To more specifically understand the operation of this feature of the present invention, refer now to FIG. **12** which is a flow chart of the operation of reviewing and navigating process in accordance with the present invention. As is seen, a first group type is selected, via step **402**. Typically, upon initialization the "group type" will be one image on the display. The group type can then be changed via the mode button. Next, it is possible to navigate between the pages within the group type via the up, down, right and left buttons, via step **404**. Thereafter a cell or particular cell or image is selected via the up, down, right or left button within the page via step **406**. Finally, the image can be reviewed, step **408**, and can be edited, to allow for the easy access to the particular image.

Navigation Control

An important feature of the present invention is the ability to navigate through a number of pages within a group type via step **406**. Referring now to FIG. **12A**, what is shown is a plurality of pages **250** of images. In a preferred embodiment, the user can navigate through and select a different "cell" **454** within a particular page by means of the four-way button. The selected cell is highlighted by the selection window **290**. As the user depresses the navigation control **271** (FIG. **8**) up, down, left, and right, the highlighted box drawn around the cells is moved accordingly.

Referring now to FIG. **13**, what is shown is a flow chart of one embodiment of navigating through the images. In this embodiment, a highlighted area is provided around the

selected cell in a page, via step **502**. A cell in this embodiment includes a particular image. Then, the selected rectangle is moved around the cells within the page based on a predetermined action, via step **504**. The predetermined action in this embodiment, for example, would include moving the highlighted area in a predetermined or natural way. That is the highlighted area can be moved up, down, left or right in a natural way with a reduced number of keystrokes. This feature will be discussed hereunder with reference to particular actions in conjunction with FIGS. **14–19**.

FIG. **14** is a flow chart showing the movement by pressing the down button. Accordingly, when the down button is pressed via step **602**, first it must be determined if the capture unit is in view mode, via step **604**. If it is in the view mode then it must be determined if this is the last cell, via step **603**. If it is the last cell then end. If it is not the last cell then go to the next cell, via step **606**. Note that view mode is the same as having one image on the screen.

If it is not in the view mode then it must be determined if the selected rectangle is at the bottom of the page, via step **608**. If the rectangle is not at the bottom of the page then it will move down one cell, via step **610**. If the rectangle is at the bottom of the page, then it must be determined if this is the last page, via step **612**. If it is the last page, then end. If it is not the last page then the selected rectangle will move down one page, via step **614** and be positioned at the bottom cell in the middle. In an alternate embodiment the selected rectangle will move to the same column as the original position of the selected rectangle, via step **616**. Thereafter a single press of the down button **268** allows for scrolling downwardly a page at a time. Note that this naturally extends the function, that is it still is a down function that is easily and naturally understood by the user. The purpose of step **716** is to allow a single down keystroke to move the highlighted area down a page at a time, once page mode is initiated.

FIG. **15** is a flow chart showing the movement by pressing the up button. Accordingly, when the up button is pressed via step **702**, first it must be determined if the capture unit is in view mode, via step **704**. If it is in the view mode then it must be determined if this is the first cell, via step **705**. If it is the first cell then end. If it is not the first cell, then go to previous cell, via step **706**.

If it is not in the view mode then it must be determined if the selected rectangle is at the top of the page, via step **708**. If the rectangle is not at the top of the page then it will move up one cell, via step **710**. If the rectangle is at the top of the page, then it must be determined if this is the first page, via step **712**. If it is the first page, then end. If it is not at the first page then the selected rectangle will move up one page, via step **714**, and be positioned at the top center cell in the same column, via step **716**. Thereafter a single press of the up button **268** allows for scrolling upwardly a page at a time. Note that this naturally extends the function, that is it still is an up function that is easily and naturally understood by the user. The purpose of step **616** is to allow a single up keystroke to move the highlighted area up a page at a time, once page mode is initiated.

FIG. **16** is a flow chart showing the movement by depressing the left button. Accordingly, when the left button is pressed via step **802**, first it must be determined if the capture unit is in the view mode, via step **804**. If it is in the view mode then it must be determined if this is the first cell, via step **803**. If it is the first cell, then end. If it is not the first cell, then go to previous cell via step **806**. If the image capture unit is not in the view mode, then it must be determined if the selected rectangle is at the left side, via step **808**. If it is at the left side, then nothing happens. However, if the rectangle is not at the left hand side, then the rectangle will move one cell to the left, via step **810**.

FIG. **17** is a flow chart showing the movement by depressing the right button. Accordingly, when the right button is pressed via step **902**, first it must be determined if the capture unit is in the view mode, via step **904**. If it is in the view mode then it must be determined if this is the last cell, via step **905**. If it is the last cell, then end. If it is not the last cell then go to the next cell.

If the image capture unit is not in the view mode, then it must be determined if the selected rectangle is at the right side, via step **908**. If it is at the right side, then nothing happens. However, if the rectangle is not at the right side, then the rectangle will move one cell to the right, via step **910**.

FIG. **18** is a flow chart showing the movement by double pressing the down button. Accordingly if the down button is double pressed, via step **1002**, first it must be determined if the capture unit is in view mode, via step **1004**. If it is in view mode, then end. Alternately, this could be handled in the same way as pressing down a single time when in the view mode. If it is not in view mode then it must be determined whether the selection rectangle is at a last page via step **1006**. If it is not at a last page then move down one page, via step **1008**. If the selection rectangle is at the last page it must be determined if there is an image at the bottom row, center column, via step **1007**. If an image is available, then go to bottom row, center column, via step **1007**. If an image is not available then go to last image, via step **1011**. This "shortcut" mechanism allows the user to enter page mode directly from any position on the page.

FIG. **19** is a flow chart showing the movement by double pressing the up button. Accordingly if the up button is double pressed, via step **1102**, first it must be determined if the capture unit is in view mode, via step **1104**. If it is in view mode, then end. Alternatively, this could be handled in the same way as pressing the up key button a single time when in the view mode. If it is not in view mode then it must be determined whether the selection rectangle is at a first page, via step **1106**. If it is at a first page, then go to the top row, center column. If it is not at a first page then move up one page, via step **1108**. This is a similar shortcut as described earlier.

In another embodiment, a triple press of the down button **268** moves the selection rectangle **290** to the last page and last image, and a triple press of the up button **266** moves the selection rectangle **290** to the first page and first image. Alternately, a double press of the left or right button could produce the same result.

The present invention provides for a more natural review and navigation system for an image capture device which facilitates faster review of images. By allowing for a more natural review, a user can more easily understand how to navigate through images, Referring back to the previous example, illustrated in FIG. **3A** in which the fourteenth image is selected for review, as was before noted at least nine keystrokes are required to display the selected image.

In a system in accordance with the present invention, considerably less keystrokes are required and they follow a more natural pattern. Referring now to FIG. **20A**, what is shown is a system for selecting the fourteenth image in accordance with the present invention. First, the mode button is pressed two times so that the group type is nine images per page (blocks **1152** and **1154**). Next, the down button is double-clicked so the bottom image of the middle

row of the next page is selected (block **1156**). Next, the up button is pressed such that the fourteenth image is selected (block **1158**). Finally, the view button is pressed to display the fourteenth image (block **1160**). Hence, as is seen, only six keystrokes are required to select the fourteenth image.

Referring now to FIG. **20**B, what is shown is a system for proceeding to the twenty-sixth image from the displayed fourteenth image. As has been before mentioned in relationship to FIG. **3**B, eight keystrokes were required to select the twenty-sixth image utilizing a conventional image capture display system. A system and method in accordance with the present invention can significantly reduce the number of keystrokes. First the view button is pressed to cause the display to return to the group type of nine images per display (block **1162**). Thereafter the down button is double-pressed (block **1164**). At this point the twenty-sixth image is selected. Thereafter, the view button is pressed and the selected image is displayed (block **1164**). Hence as is seen, a total of only four keystrokes are required to select the twenty-sixth image.

Therefore, as can be seen, a method and system is provided for reviewing and navigating among images displayed on an image capture device in an efficient and straightforward manner. This system is more natural than previously known systems because the movement is straightforward. Each of the keys has only one function and that functionality remains consistent. In so doing, this system facilitates ease in navigating through and reviewing such images produced and is extremely advantageous over known conventional techniques.

Although the present invention has been described in accordance with the embodiments shown in the figures, one of ordinary skill in the art recognizes there could be variations to the embodiments and those variations would be within the spirit and scope of the present invention. Accordingly, many modifications may be made by one of ordinary skills in the art without departing from the spirit and scope of present invention, the scope of which is defined by the appended claims.

What is claimed is:

1. A method for reviewing and navigating through images in an image capture device, the image capture device including a display and a four-way navigation button having left, right, up and down buttons, comprising the steps of:

a) displaying images on the image capture device in a predetermined number of group types, each of the group types indicating the number of images to be simultaneously displayed, the number of images to be simultaneously displayed being a page;

b) allowing a user to select one group type from the predetermined number of group types;

c) highlighting a selected image on a current page with a highlight area;

d) allowing the user to scroll directly from the current page to a next page or a previous pare within the group type with a single button press by

i) displaying the next page in response to the user pressing the down button when the highlighting area is located at a bottom of the current page, wherein the highlighting area is placed at the bottom of the next page, and

ii) displaying the previous page in response to the user pressing the up button when the highlighting area is located at a top of the current page, wherein the highlighting area is placed at the top of the previous page;

e) allowing the user to scroll directly from the current page to the next page or the previous page within the group type with two button presses when the highlighting area is located at any position on the current page by

i) displaying the next page in response to user double pressing the down button, and

ii) displaying the previous page in response to user double pressing the up button; and

f) allowing the user to scroll directly from the current page to a first page or a last page within the group type with three button presses by

i) displaying the last page in response to a user triple pressing the down button; and

ii) displaying the first page of images in response to a user triple pressing the up button.

2. The method of claim **1** in which each group type includes at least one cell, each cell including an image.

3. The method of claim **2** in which step (c) comprises the steps of:

c1) providing the highlighted are a around a selected cell within a particular page of images; and

c2) moving the highlighted area around the group type based upon a predetermined action.

4. The method of claim **3** in which the predetermined action includes pressing one of the up, down, right and left buttons to move the highlighted area one cell away from its previous location.

5. The method of claim **3** in which the predetermined action comprises double pressing the right button to move the highlighting area to the next page of images.

6. The method of claim **3** in which the predetermined action comprises double pressing the left button to move the highlight area to the previous page of images.

7. The method of claim **1** in which the highlighted area comprises a selection rectangle.

8. A system for reviewing and navigating through images in an image capture device, the image capture device including a display and a four-way navigation button having left, right, up and down buttons, comprising the steps of:

means for displaying images on the image capture device in a predetermined number of group types, each of the group types indicating a number of images to be simultaneously displayed, the number of images to be simultaneously displayed being a page;

means for selecting one group type from the predetermined number of group types;

means for highlighting a selected image on a current page using a highlighting area;

means for allowing the user to scroll directly from the current page to a next page or a previous page within the group type with a single button press by

i) displaying the next page in response to the user pressing the down button when the highlighting area is located at a bottom of the current page, wherein the highlighting area is placed at the bottom of the next page, and

ii) displaying the previous page in response to the user pressing the up button when the highlighting area is located at a top of the current page, wherein the highlighting area is placed at the top of the previous page;

means for allowing the user to scroll directly from the current page to the next page or the previous page within the group type with two button presses when the highlighting area is located at any position on the current page by

i) displaying the next page in response to user double pressing the down button, and

ii) displaying the previous page in response to user double pressing the up button; and

means for allowing the user to scroll directly from the current page to a first page or a last page within the group type with three button presses by

i) displaying the last page in response to a user triple pressing the down button; and

ii) displaying the first page of images in response to a user triple pressing the up button.

9. The system of claim **8** in which each group type includes at least one cell, each cell including an image.

10. The system of claim **9** further including:

means for providing the highlighted area around a selected cell within a particular page of images; and

means for moving the highlighted area around the group type based upon a predetermined action.

11. The system of claim **10** in which the predetermined action includes pressing one of the up, down, right and left buttons to move the highlighted area one cell away from its previous location.

12. The system of claim **10** in which the predetermined action comprises double pressing the right button to move the highlighting area to the next page of images.

13. The system of claim **10** in which the predetermined action comprising double pressing the left button to move the highlighting area to the previous page of images.

14. The system of claim **8** in which the highlighted area comprises a selection rectangle.

* * * * *